and amplifies received signals. The power chip **38** outputs the amplified received signal to the radio frequency (RF) chip **40**, which demodulates and downconverts the signal for baseband processing. The baseband (BB) chip **42** detects the signal, which is then converted to a bit-stream and finally decoded. Similar processing occurs in reverse for signals generated in the UE **10** and transmitted from it.

**[0089]** Signals to and from the camera **28** pass through an image/video processor (video) **44**, which encodes and decodes the image data (e.g., image frames). A separate audio processor **46** may also be present to control signals to and from the speakers (spkr) **34** and the microphone **24**. The graphical display interface **20** is refreshed from a frame memory (frame mem) **48** as controlled by a user interface/display chip **50**, which may process signals to and from the display interface **20** and/or additionally process user inputs from the keypad **22** and elsewhere.

**[0090]** Certain exemplary embodiments of the UE **10** may also include one or more secondary radios such as a wireless local area network radio (WLAN) **37** and/or a Bluetooth® radio (BT) **39**, which may incorporate one or more on-chip antennas or be coupled to one or more off-chip antennas. Throughout the UE **10** are various memories, such as a random access memory (RAM) **43**, a read only memory (ROM) **45**, and, in some exemplary embodiments, a removable memory such as the illustrated memory card **47**. In some exemplary embodiments, the various programs **10**C are stored on the memory card **47**. The components within the UE **10** may be powered by a portable power supply such as a battery **49**.

**[0091]** The aforesaid processors **38**, **40**, **42**, **44**, **46**, **50**, if embodied as separate entities in the UE **10** or the eNB **12**, may operate in a master-slave relationship with respect to the main/master processor **10**A, **12**A. Exemplary embodiments of this invention may be most relevant to one or more processors (e.g., the main/master processor **10**A), though it is noted that other exemplary embodiments need not be disposed in such devices or components, but may be disposed across various chips and/or memories as shown, or disposed within one or more other processors that combine one or more of the functions described above with respect to FIG. **2**B. Any or all of these various processors of FIG. **2**B may access one or more of the various memories, which may be on-chip with the processor or separate therefrom. Similar function-specific components that are directed toward communications over a network broader than a piconet (e.g., components **36**, **38**, **40**, **42**-**45** and **47**) may also be disposed in exemplary embodiments of the access node **12**, which, in some exemplary embodiments, may include an array of tower-mounted antennas rather than the antennas **36** shown in FIG. **2**B.

**[0092]** Note that the various processors and/or chips (e.g., **38**, **40**, **42**, etc.) described above may be combined into a fewer number of such processors and/or chips and, in a most compact case, may be embodied physically within a single processor or chip.

**[0093]** While described above in reference to memories, these components may generally be seen to correspond to storage devices, storage circuits, storage components and/or storage blocks. In some exemplary embodiments, these components may comprise one or more computer-readable mediums, one or more computer-readable memories and/or one or more program storage devices.

**[0094]** While described above in reference to processors, these components may generally be seen to correspond to processors, data processors, processing devices, processing components, processing blocks, circuits, circuit devices, circuit components, circuit blocks, integrated circuits and/or chips (e.g., chips comprising one or more circuits or integrated circuits).

**[0095]** One possible approach to the above-noted problems is to obtain the timing information, and thus the CP length, by correlating the hypothesized CP position/length with its copy located at the end of the OFDM symbol. However, the E-UTRAN signal structure is designed such that this correlation and complexity can be avoided.

**[0096]** Thus, it is desirable to provide apparatus, methods, computer program products and techniques that address the above-identified CP length detection issues, and do so further in view of the E-UTRAN signal structure. Exemplary embodiments of the invention provide signaling (e.g., DL RS signaling or one or more messages) that is indicative, explicitly or implicitly, of a CP length. Some exemplary embodiments of the invention use DL RS sequences and/or mappings (e.g., in all RS-bearing OFDM symbols) that are dependent on the CP length. In such a manner, and as an example, there are different DL RS sequences and/or mappings for the normal CP length and the extended CP length. Some exemplary embodiments of the invention provide cyclic prefix length-dependent scrambling of reference signals.

**[0097]** In one exemplary embodiment, the DL RS scrambling initialization includes at least one field (or at least one bit) indicative of the cyclic prefix length. As a non-limiting example, instead of the DL RS initialization as specified in TS 36.211 V8.2.0, the Gold sequence generator initialization may comprise: {CP length indicator, OFDM symbol number, subframe number, cell ID}. As a non-limiting example, the CP length indicator may have a value of "1" for the normal CP and a value of "0" for the extended CP. As a further non-limiting example, the CP length indicator may have a value of "0" for the normal CP and a value of "1" for the extended CP. In other exemplary embodiments, the CP length indicator may comprise different values or a different number of values (e.g., for more than two CP lengths). Note that as specified in TS 36.211 V8.2.0, the Gold sequence generator initialization comprises: {OFDM symbol number, subframe number, cell ID}.

**[0098]** In other exemplary embodiments, instead of adding to the DL RS initializer, the initializer (such as a conventional or previously-specified initializer) is otherwise modified or manipulated in order to indicate the CP length. Various non-limiting examples of such modification or manipulation are described below.

**[0099]** As specified, the DL RS scrambling initialization includes natural OFDM symbol numbering. That is, the RS-bearing OFDM symbols are numbered {0, 4, 7, 11} for a normal CP and {0, 3, 6, 9} for an extended CP.

**[0100]** In one exemplary embodiment of the invention, the DL RS scrambling initialization is modified to indicate the CP length by including reversal OFDM symbol numbering in the first slot of a subframe and natural OFDM symbol numbering in the second slot of the subframe, where said modification is indicative of a certain CP length (e.g., a normal CP length or an extended CP length). For example, assuming reversal of the OFDM symbol numbering for the